

REMARKS

In the final Office Action of October 18, 2004, the Examiner rejected claims 1-27 under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement; rejected claims 21, 26, and 27 under 35 U.S.C. § 102(e) as being anticipated by US Patent No. 6,688,280 to Weber et al.; rejected claims 21, 26, and 27 under 35 U.S.C. § 102(b) as being anticipated by US Patent No. 6,257,182 to Hara et al.; rejected claims 21, 26, and 27 under 35 U.S.C. § 102(b) as being anticipated by US Patent No. 4,258,671 to Takizawa et al.; rejected claims 21, 26, and 27 under 35 U.S.C. § 102(e) as being anticipated by US Patent No. 6,647,935 to Aoyama et al.; rejected claims 21, 26, and 27 under 35 U.S.C. § 102(e) as being anticipated by US Patent No. 6,691,654 to Uehara et al.; rejected claims 1, 12, 13, and 17 under 35 U.S.C. § 103(a) as being unpatentable over Takizawa et al. in view of US Patent No. 5,529,030 to Rose; rejected claims 1, 12, 13, and 17 under 35 U.S.C. § 103(a) as being unpatentable over Weber et al. in view of Rose; rejected claims 1, 12, 13, and 17 under 35 U.S.C. § 103(a) as being unpatentable over Hara et al. in view of Rose; rejected claims 1, 12, and 17 under 35 U.S.C. § 103(a) as being unpatentable over Aoyama et al. in view of Rose; rejected claims 1, 12, and 17 under 35 U.S.C. § 103(a) as being unpatentable over Uehara et al. in view of Rose; rejected claims 2-11, 14-16, and 18-20 under 35 U.S.C. § 103(a) as being unpatentable over Weber in view of Rose, and further in view of US Patent No. 5,720,261 to Sturman et al.; rejected claims 2-11, 14-16, and 18-20 under 35 U.S.C. § 103(a) as being unpatentable over Hara in view of Rose, and further in view of US Patent No. 5,720,261 to Sturman et al.; rejected claims 22-25 under 35 U.S.C. § 103(a) as being unpatentable over Weber in view Sturman et al.; rejected claims 22-25 under 35 U.S.C. § 103(a) as being unpatentable over Hara in view Sturman et al.;

rejected claims 22-25 under 35 U.S.C. § 103(a) as being unpatentable over Takazawa in view Sturman et al.; rejected claims 22-25 under 35 U.S.C. § 103(a) as being unpatentable over Aoyama in view Sturman et al.; and rejected claims 22-25 under 35 U.S.C. § 103(a) as being unpatentable over Uehara in view Sturman et al.

Applicants have cancelled claims 22, 23, and 27; amended claims 1-3, 7, 12-14, 17-19, 21, 24, and 26; and have added new claims 28-44 to further claim aspects of Applicants' invention. Accordingly, claims 1-21, 24-26, and 28-44 are pending in this application.

Applicants respectfully traverse the rejection of claims 1-27 under 35 U.S.C. § 112, first paragraph, for at least the reason that the originally filed specification provides proper antecedent support for each aspect of the pending claims. Although Applicants disagree with the Examiner, in order to advance prosecution of this application, Applicants have amended independent claims 1, 12, 17, and 21 to remove the phrases "mechanically contact the intake valve," "end," and "selectively hold" that were objected to by the examiner. Accordingly, the section 112, first paragraph, rejection with respect to independent claims 1, 12, 17, and 21, and claims 2-11, 13-16, 18-20, 24, and 25, which ultimately depend from one of independent claims 1, 12, 17, and 21, is moot and should be withdrawn.

However, with respect to claim 26, Applicants have retained the phrase "selectively hold." Applicants submit that all of the elements of claim 26 are fully described in the originally-filed specification in such a manner as to clearly convey that the inventors had possession of the claimed invention at the time the application was filed. In particular, as described at least on page 9, paragraph 39 of the specification,

an end of a core (85), of the electromagnetic actuator recited by independent claim 26, engages a first end (76) of a rocker arm (64) to hold an intake valve (32) open to implement a late intake Miller cycle. As also described at least on page 9, paragraph 37, valve actuation assembly 44, which includes the electromagnetic actuator recited by independent claim 26, may be operated to selectively implement a late intake Miller cycle. Because the specification, as originally filed on October 31, 2003, fully describes the invention recited in independent claim 26, the rejection of independent claim 26 under section 112, first paragraph, is improper and should be withdrawn.

Applicants respectfully traverse the 35 U.S.C. § 102(e) rejection of claims 21, 26, and 27 as being anticipated by Weber et al. for at least the reason that Weber et al. fails to disclose every claim element. For example, independent claim 21 discloses a combination of elements including, among other things, an electromagnetic actuator configured to affect closing of an intake valve, wherein the electromagnetic actuator is a latching solenoid having a solenoid coil and an armature coupled with a core, the armature and core being movable together relative to the solenoid coil. Independent claim 26 discloses a combination of steps including, among other things, engaging an electromagnetic solenoid with an end of a rocker arm opposite a cam to selectively hold an intake port open, wherein engaging includes controllably moving a coupled armature and core of the electromagnetic actuator between a first position and a second position. Weber et al. fails to disclose at least these claim elements.

In the Office Action, the Examiner maintained that Weber et al. discloses an electromagnetic actuator configured to selectively hold an intake valve in position between a first end position and a second end position, wherein the electromagnetic

actuator includes a solenoid coil and an armature coupled with a core, the armature and the core being movable together relative to the solenoid coil. Specifically, the Examiner suggested that variable intake valve closing mechanism (238) of Weber et al. constitutes the claimed electromagnetic actuator of independent claim 21. However, Weber et al. does not describe the variable intake valve closing mechanism (238) being an electromagnetic actuator. In fact, Weber et al. does not recite any specific structure for the variable intake valve closing mechanism (238), much less a solenoid coil and an armature coupled with a core or an armature and core being movable together. As recited in col. 5, line 61 through col. 6, line 5, Weber et al. describes the variable intake valve closing mechanism only as being operated hydraulically, pneumatically, electrically, or mechanically.

In addition, Weber et al. does not disclose moving a coupled armature and core between a first position and a second position, as recited in independent claim 26. In contrast, the only example that Weber et al. discloses includes the variable intake valve closing mechanism (238) being actuated only to supply a hydraulic fluid that resists closing of an intake valve.

For at least these reasons, Weber et al. fails to disclose all the elements of claims 21 and 26. Accordingly, the rejection under 35 U.S.C. § 102(e) with respect to claims 21 and 26, as being anticipated by Weber et al., is improper and should be withdrawn.

Applicants respectfully traverse the 35 U.S.C. § 102(b) rejection of claims 21, 26, and 27 as being anticipated by Hara et al. for at least the reason that Hara et al. fails to disclose every claim element. For example, independent claim 21 recites a combination

of elements including, among other things, a cam assembly configured to open and close an intake port, an electromagnetic actuator configured to affect closing of the intake port, and a rocker arm disposed between the cam assembly and the electromagnetic actuator, the rocker arm being configured to engage the intake valve. Further, independent claim 26 discloses a combination of steps including, among other things, moving an intake valve via a rocker arm to open and close an intake port, engaging a cam with an end of the rocker arm to affect movement of the intake valve, and engaging an electromagnetic solenoid with an end of the rocker arm opposite the cam to selectively hold the intake port open. Hara et al. fails to disclose at least these claim elements.

In the Office Action, the Examiner maintained that Hara et al. discloses a cam assembly connected to an intake valve to move the intake valve between first and second positions, and an electromagnetic actuator configured to selectively modify timing of the intake valve. The Examiner also maintained that Hara et al. discloses a rocker arm coupling the cam assembly with the intake valve. Specifically, the Examiner suggested that first and second swing cams (56, 57), electromagnetic drive mechanism (24), and first swing cam (56) of Hara et al. constitute the cam assembly, electromagnetic actuator, and rocker arm of independent claim 21. However, swing cam (56) of Hara et al. is not disposed between electromagnetic drive mechanism (24) and swing cam (57). In contrast, as illustrated in Figs. 8 and 13, swing cam (56) is disposed between electromagnetic drive mechanism (24) and an intake valve.

In addition, Hara et al. does not disclose engaging swing cam (57) with an end of a rocker arm or engaging electromagnetic drive mechanism (24) with a rocker arm

opposite to an end of a cam, as recited in claim 26. Instead, as described above, swing cam (56) is located between electromagnetic drive mechanism (24) and the intake valve, and never engages a cam assembly at all.

For at least these reasons, Hara et al. fails to disclose all the elements of claims 21 and 26. Accordingly, the rejection under section 102(b) with respect to claims 21 and 26, as being anticipated by Hara et al., is improper and should be withdrawn.

Applicants respectfully traverse the 35 U.S.C. § 102(b) rejection of claims 21, 26, and 27 as being anticipated by Takizawa et al. for at least the reason that Takizawa et al. fails to disclose every claim element. As recited above, independent claim 21 discloses a combination of elements including, among other things, a cam assembly configured to open and close an intake port, an electromagnetic actuator configured to affect closing of the intake port, and a rocker arm disposed between the cam assembly and the electromagnetic actuator, the rocker arm being configured to engage the intake valve. As also recited above, independent claim 26 discloses a combination of steps including, among other things, moving an intake valve via a rocker arm to open and close an intake port, engaging a cam with an end of the rocker arm to affect movement of the intake valve, and engaging an electromagnetic solenoid with an end of the rocker arm opposite the cam to selectively hold the intake port open. Takizawa et al. fails to disclose at least these elements.

In the Office Action, the Examiner maintained that Takizawa et al. discloses a cam assembly configured to move an intake valve, and an electromagnetic actuator configured to selectively hold the intake valve in position. The Examiner also maintained that Takizawa et al. discloses a rocker arm operably coupling the cam

assembly with the intake valve. Specifically, the Examiner suggested that cam (41), electromagnetic valve (43), and rocker arm (13) of Takizawa et al. constitute the cam assembly, electromagnetic actuator, and rocker arm of independent claim 21. However, rocker arm (13) is not disposed between a cam assembly and an electromagnetic actuator. In contrast, as illustrated in the figure of Takizawa et al. rocker arm (13) of Takizawa et al. is not located between any other components of Takizawa et al. at all.

In addition, Takizawa et al. does not disclose engaging electromagnetic valve (43) with an end of a rocker arm, as recited in claim 26. In contrast, as recited in the abstract of Takizawa et al., electromagnetic valve (43) is actuated only to maintain an oil pressure that varies valve lift and is not associated with a rocker arm at all.

For at least these reasons, Takizawa et al. fails to disclose all the elements of claims 21 and 26. Accordingly, the rejection under 35 U.S.C. § 102(b) with respect to claims 21 and 26, as being anticipated by Takizawa et al., is improper and should be withdrawn.

Applicants respectfully traverse the 35 U.S.C. § 102(e) rejection of claims 21, 26, and 27 as being anticipated by Aoyama et al. for at least the reason that Aoyama et al. fails to disclose every claim element. As described above, independent claim 21 discloses a combination of elements including, among other things, a cam assembly configured to open and close an intake port, an electromagnetic actuator configured to affect closing of the intake port, and a rocker arm disposed between the cam assembly and the electromagnetic actuator, the rocker arm being configured to engage the intake valve. As also recited above, independent claim 26 discloses a combination of steps including, among other things, moving an intake valve via a rocker arm to open and

close an intake port, engaging a cam with an end of the rocker arm to affect movement of the intake valve, and engaging an electromagnetic solenoid with an end of the rocker arm opposite the cam to selectively hold the intake port open. Aoyama et al. fails to disclose at least these elements.

In the Office Action, the Examiner maintained that Aoyama et al. discloses a cam assembly configured to move an intake valve, an electromagnetic actuator configured to keep the intake valve in position, and a rocker arm. Specifically, the Examiner suggested that a control mechanism (20), a hydraulic actuator (21) and a hydraulic control module (22), and a rockable cam (24) of Aoyama et al. constitute the cam assembly, electromagnetic actuator, and rocker arm of independent claim 21. However, rockable cam (24) is not disposed between a cam assembly and an electromagnetic actuator. Further, Aoyama et al. does not disclose engaging hydraulic actuator (21) with an end of a rocker arm opposite a cam, as recited in claim 26.

For at least these reasons, Aoyama et al. fails to disclose all the elements of claims 21 and 26. Accordingly, the rejection under section 102(e) of claims 21 and 26, as being anticipated by Aoyama et al., is improper and should be withdrawn.

Applicants respectfully traverse the 35 U.S.C. § 102(e) rejection of claims 21, 26, 27 as being anticipated by Uehara et al. for at least the reason that Uehara et al. fails to disclose every claim element. Independent claim 21 discloses a combination of elements including, among other things, a cam assembly configured to open and close an intake port, an electromagnetic actuator configured to affect closing of the intake port, and a rocker arm disposed between the cam assembly and the electromagnetic actuator, the rocker arm being configured to engage the intake valve. As also recited

above, independent claim 26 discloses a combination of steps including, among other things, moving an intake valve via a rocker arm to open and close an intake port, engaging a cam with an end of the rocker arm to affect movement of the intake valve, and engaging an electromagnetic solenoid with an end of the rocker arm opposite the cam to selectively hold the intake port open. Uehara et al. fails to disclose at least these elements.

In the Office Action, the Examiner maintained that Uehara et al. discloses a cam assembly configured to move an intake valve, an electromagnetic actuator configured to selectively hold the intake valve in position, and a rocker arm. Specifically, the Examiner suggested that a drive cam (15), a rockable cam (17), and a rocker arm (23) of Uehara et al. constitute the cam assembly; that rockable cam (17) constitutes the rocker arm; and that a motor (34) constitutes the electromagnetic actuator of independent claims 21 and 26. However, rockable cam (17) cannot be both a cam assembly and a rocker arm. Further, even if rockable cam (17) could correctly be considered both a cam assembly and a rocker arm, rockable cam (17) is not disposed between a cam assembly and an electromagnetic actuator. In addition, Uehara et al. does not disclose engaging motor (34) with an end of a rocker arm opposite a cam, as recited in claim 26.

For at least these reasons, Uehara et al. fails to disclose all the elements of claims 21 and 26. Accordingly, the rejection under section 102(e) with respect to claims 21 and 26, as being anticipated by Uehara et al., is improper and should be withdrawn.

Applicants respectfully traverse the 35 U.S.C. § 103(a) rejection of claims 1, 12, 13, and 17, as being unpatentable over Takizawa et al. in view of Rose. No *prima facie*

case of obviousness has been established with respect to claims 1, 12, 13, and 17 for at least the reason that no combination of Takizawa et al. and Rose discloses or suggests every claim element. For example, independent claims 1 and 17 recite a combination of elements including, among other things, a cam assembly configured to open and close an intake port, and a separate actuator electromagnetically operated to selectively close the intake port at a different timing than the cam assembly. Further, independent claim 12, from which claim 13 depends, recites a combination of steps including, among other things, opening and closing an intake port associated with an intake valve via a cam, and operating a separate actuator having an electromagnetic solenoid associated with the intake valve when the intake port is open to selectively close the intake port at a different timing than the cam assembly. Takizawa et al. and Rose, alone and in combination, fail to disclose or suggest at least these claim elements.

As described above, the Examiner maintained that cam (41) and electromagnetic valve (43) of Takizawa et al. constitute the cam assembly and electromagnetic actuator of independent claims 1 and 17. However, as described in col. 3, line 59 through col. 4, line 49, electromagnetic valve (43) only controls a hydraulic fluid that flows into and out of a pressure chamber (51b) to transmit movement of cam (41) to a rocker arm pad (13a). Electromagnetic valve (43) is not a separate actuator and has no affect on an intake port without dependent movement of cam (41). Rose, which was cited only for its alleged teaching of mechanical contact, fails to remedy these deficiencies.

Similarly, because electromagnetic valve (43) is not a separate actuator, Takizawa et al. cannot and does not disclose or suggest opening and closing an intake

port associated with an intake valve via a cam and operating a separate actuator.

Again, Rose fails to remedy these deficiencies.

Because Takizawa et al. and Rose, taken either alone or in combination, fail to disclose or suggest all of the elements of claims 1, 12, 13, and 17, no *prima facie* case of obviousness has been established with respect to claims 1, 12, 13, and 17.

Accordingly, the section 103(a) rejection of claims 1, 12, 13, and 17, as being unpatentable over Takizawa et al. in view of Rose, is improper and should be withdrawn.

Applicants respectfully traverse the 35 U.S.C. § 103(a) rejection of claims 1, 12, 13, and 17, as being unpatentable over Weber et al. in view of Rose. The 35 U.S.C. § 103(a) rejection of claims 1, 12, 13, and 17 is improper for at least the reason that Weber et al. cannot be used as the basis for a 103(a) rejection. Weber et al. qualifies as prior art only under 102(e) and, as acknowledged by the Examiner in the Office Action, both Weber et al. and the instant application were subject to an obligation of assignment to the same person at the time the invention of the instant application was made. In particular, Assignee, Caterpillar Inc., duly organized under the laws of Delaware and having its principal place of business at 100 N.E. Adams Street, Peoria, Illinois 61629-6490, represents that it is the assignee of the entire right, title and interest in and to the above-identified application, Application No. 10/697,437 filed October 31, 2003 for ENGINE VALVE ACTUATION SYSTEM in the names of HOMA AFJEH et al., as indicated by assignment(s) duly recorded in the United States Patent and Trademark Office at Reel 014660, Frame 0284 on October 31, 2003. Assignee, Caterpillar Inc., further represents that it is the assignee of the entire right, title and interest in and to

U.S. Patent No. 6,688,280, as indicated by assignment(s) duly recorded in the United States Patent and Trademark Office at Reel 013157, Frame 0837 on August 2, 2002.

As recited in 35 U.S.C. § 103(c), "Subject matter developed by another person, which qualifies as prior art only under one or more of subsections (e), (f), and (g) of section 102..., shall not preclude patentability under this section [35 U.S.C. § 103] where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person." Accordingly, the rejection of claims 1, 12, 13, and 17 under 35 U.S.C. § 103(a) as being unpatentable over Weber et al. in view of Rose should be withdrawn.

Applicants respectfully traverse the 35 U.S.C. § 103(a) rejection of claims 1, 12, 13, and 17, as being unpatentable over Hara et al. in view of Rose. No *prima facie* case of obviousness has been established with respect to claims 1, 12, 13, and 17 for at least the reason that no combination of Hara et al. and Rose discloses or suggests every claim element. As recited above, independent claims 1 and 17 recite a combination of elements including, among other things, a cam assembly configured to open and close an intake port, and a separate actuator electromagnetically operated to selectively close the intake port at a different timing than the cam assembly. Further, independent claim 12, from which claim 13 depends, recites a combination of steps including, among other things, opening and closing an intake port associated with an intake valve via a cam, and operating a separate actuator having an electromagnetic solenoid associated with the intake valve when the intake port is open to selectively close the intake port at a different timing than the cam assembly. Hara et al. and Rose, alone and in combination, fail to disclose or suggest at least these claim elements.

As described above, the Examiner has maintained that first and second swing cams (56, 57) and electromagnetic drive mechanism (24) of Hara et al. constitute the cam assembly and electromagnetic actuator of independent claims 1 and 17. However, swing cams (56, 57) of Hara et al. do not open or close an intake valve, but only act to dampen movement caused by electromagnetic drive mechanism (24). In addition, because swing cams (56, 57) do not move independent of electromagnetic drive mechanism (24), the electromagnetic drive mechanism (24) of Hara et al. cannot close the intake valve at a different time than swing cams (56, 57). Further, because swing cams (56, 57) are integrated within electromagnetic drive mechanism (24) to dampen movement of electromagnetic drive mechanism (24), electromagnetic drive mechanism (24) is not a separate actuator, as recited in independent claims 1 and 17. Rose, which was cited only for its alleged teaching of mechanical contact, fails to remedy these deficiencies.

Similarly, because swing cams (56, 57) cannot open or close an intake valve and because electromagnetic valve (24) is not a separate actuator, Hara et al. cannot and does not disclose or suggest opening and closing an intake port associated with an intake valve via a cam and operating a separate actuator to selectively close the intake port at a different timing, as recited in independent claim 12. Again, Rose fails to remedy these deficiencies.

Because Hara et al. and Rose, taken alone and in combination, fail to disclose or suggest all of the elements of independent claims 1, 12, and 17, no *prima facie* case of obviousness has been established with respect to independent claims 1, 12, and 17.

Accordingly, the section 103(a) rejection of claims 1, 12, 13, and 17, as being unpatentable over Hara et al. in view of Rose, is improper and should be withdrawn.

Applicants respectfully traverse the 35 U.S.C. § 103(a) rejection of claims 1, 12, and 17, as being unpatentable over Aoyama et al. in view of Rose. No *prima facie* case of obviousness has been established with respect to claims 1, 12, and 17 for at least the reason that no combination of Aoyama et al. and Rose discloses or suggests every claim element. As recited above, independent claims 1 and 17 recite a combination of elements including, among other things, a cam assembly configured to open and close an intake port, and a separate actuator electromagnetically operated to selectively close the intake port at a different timing than the cam assembly. Further, independent claim 12 recites a combination of steps including, among other things, opening and closing an intake port associated with an intake valve via a cam, and operating a separate actuator having an electromagnetic solenoid associated with the intake valve when the intake port is open to selectively close the intake port at a different timing than the cam assembly. Aoyama et al. and Rose, alone and in combination, fail to disclose or suggest at least these claim elements.

As described above, the Examiner has maintained that control mechanism (20), and hydraulic actuator (21) and hydraulic control module (22) of Aoyama et al. constitute the cam assembly and electromagnetic actuator of independent claims 1 and 17. However, hydraulic actuator (21) is not a separate actuator, is not electromagnetically operated, and does not close an intake port. In contrast, as described in col. 6, lines 26-29 and 49-53, hydraulic actuator (21) is hydraulically operated only to affect cam movement and cannot itself close the intake port at all,

much less at a timing different from the cam whose movement it affects. Rose, which was cited only for its alleged teaching of mechanical contact, fails to remedy these deficiencies.

Further, because hydraulic actuator (21) cannot open or close an intake valve and because hydraulic actuator (21) is not a separate actuator, Aoyama et al. cannot and does not disclose or suggest opening and closing an intake port associated with an intake valve via a cam and operating a separate actuator to selectively close the intake port at a different timing, as recited in independent claim 12. Again, Rose fails to remedy these deficiencies.

Because Aoyama et al. and Rose, taken alone and in combination, fail to disclose or suggest all of the elements of independent claims 1, 12, and 17, no *prima facie* case of obviousness has been established with respect to independent claims 1, 12, and 17. Accordingly, the section 103(a) rejection of claims 1, 12, and 17, as being unpatentable over Aoyama et al. in view of Rose, is improper and should be withdrawn.

Applicants respectfully traverse the 35 U.S.C. § 103(a) rejection of claims 1, 12, and 17 as being unpatentable over Uehara et al. in view of Rose. No *prima facie* case of obviousness has been established with respect to claims 1, 12, and 17 for at least the reason that no combination of Uehara et al. and Rose discloses or suggests every claim element. As recited above, independent claims 1 and 17 recite a combination of elements including, among other things, a cam assembly configured to open and close an intake port, and a separate actuator electromagnetically operated to selectively close the intake port at a different timing than the cam assembly. Further, independent claim 12 recites a combination of steps including, among other things, opening and closing an

intake port associated with an intake valve via a cam, and operating a separate actuator having an electromagnetic solenoid associated with the intake valve when the intake port is open to selectively close the intake port at a different timing than the cam assembly. Uehara et al. and Rose, alone and in combination, fail to disclose or suggest at least these claim elements.

As described above, the Examiner has maintained that a drive cam (15), a rockable cam (17), and a rocker arm (23) of Uehara et al. constitute the cam assembly; and that a motor (34) constitutes the electromagnetic actuator of independent claims 1 and 17. However, motor (34) is not a separate actuator and does not close an intake port. In contrast, as described in col. 7, line 9 through col. 9, line 29, motor (34) only affects the movement of drive cam (15) and cannot itself close the intake port at all, much less at a timing different from the drive cam whose movement it affects. Rose, which was cited only for its alleged teaching of mechanical contact, fails to remedy these deficiencies.

Further, because motor (34) cannot open or close an intake valve and is not a separate actuator, Uehara et al. cannot and does not disclose or suggest opening and closing an intake port associated with an intake valve via a cam and operating a separate actuator to selectively close the intake port at a different timing, as recited in independent claim 12. Again, Rose fails to remedy these deficiencies.

Because Uehara et al. and Rose, taken alone and in combination, fail to disclose or suggest all of the elements of independent claims 1, 12, and 17, no *prima facie* case of obviousness has been established with respect to independent claims 1, 12, and 17.

Accordingly, the section 103(a) rejection of claims 1, 12, and 17, as being unpatentable over Uehara et al. in view of Rose, is improper and should be withdrawn.

Applicants respectfully traverse the 35 U.S.C. § 103(a) rejection of claims 2-11, 14-16, and 18-20 as being unpatentable over Weber et al. in view of Rose, and further in view of Sturman et al. The 35 U.S.C. § 103(a) rejection of claims 2-11, 14-16, and 18-20 is improper for at least the reason that Weber et al. cannot be used as the basis for a 103(a) rejection. Weber et al. qualifies as prior art only under 102(e) and, as indicated both by the Examiner and as described above, both Weber et al. and the instant application were subject to an obligation of assignment to the same person at the time the invention of the instant application was made. Accordingly, the rejection of claims 2-11, 14-16, and 18-20 under 35 U.S.C. § 103(a) as being unpatentable over Weber et al. in view of Rose, in further view of Sturman et al. should be withdrawn.

Applicants respectfully traverse the 35 U.S.C. § 103(a) rejection of claims 2-11, 14-16, and 18-20 as being unpatentable over Hara et al. in view of Rose, and further in view of Sturman et al. No *prima facie* case of obviousness has been established with respect to claims 2-11, 14-16, and 18-20 for at least the reason that no combination of Hara et al., Rose, and Sturman et al. discloses or suggests every claim element. As recited above, independent claims 1 and 17, from one of which claims 2-11 and 18-20 ultimately depend, recite a combination of elements including, among other things, a cam assembly configured to open and close an intake port, and a separate actuator electromagnetically operated to selectively close the intake port at a different timing than the cam assembly. Further, independent claim 12, from which claims 14-16 ultimately depend, recites a combination of steps including, among other things,

opening and closing an intake port associated with an intake valve via a cam, and operating a separate actuator having an electromagnetic solenoid associated with the intake valve when the intake port is open to selectively close the intake port at a different timing than the cam assembly. Hara et al., Rose, and Sturman et al., alone and in combination, fail to disclose or suggest at least these claim elements.

As described above, swing cams (56, 57) of Hara et al. do not open or close an intake valve, but only act to dampen movement caused by electromagnetic drive mechanism (24). In addition, because swing cams (56, 57) do not move independent of electromagnetic drive mechanism (24), the electromagnetic drive mechanism (24) of Hara et al. cannot close the intake valve at a different time than swing cams (56, 57). Further, because swing cams (56, 57) are integrated within electromagnetic drive mechanism (24) to dampen movement of electromagnetic drive mechanism (24), electromagnetic drive mechanism (24) is not a separate actuator, as recited in independent claims 1 and 17. Rose, which was cited only for its alleged teaching of mechanical contact, fails to remedy these deficiencies. Sturman et al., which was cited only for its alleged teaching of a controller also fails to remedy these deficiencies.

Similarly, because swing cams (56, 57) cannot open or close an intake valve and because electromagnetic valve (24) is not a separate actuator, Hara et al. cannot and does not disclose or suggest opening and closing an intake port associated with an intake valve via a cam and operating a separate actuator to selectively close the intake port at a different timing, as recited in independent claim 12. Again, both Rose and Sturman et al. fail to remedy these deficiencies.

Because Hara et al., Rose, and Sturman et al., taken alone and in combination, fail to disclose or suggest all of the elements of claims 2-11, 14-16, and 18-20, no *prima facie* case of obviousness has been established with respect to claims 2-11, 14-16, and 18-20. Accordingly, the section 103(a) rejection of claims 2-11, 14-16, and 18-20, as being unpatentable over Hara et al. in view of Rose, and further in view of Sturman et al., is improper and should be withdrawn.

Applicants respectfully traverse the 35 U.S.C. § 103(a) rejection of claims 22-25 as being unpatentable over Weber et al. in view of Sturman et al. The 35 U.S.C. § 103(a) rejection of claims 22-25 is improper for at least the reason that Weber et al. cannot be used as the basis for a 103(a) rejection. Weber et al. qualifies as prior art only under 102(e) and, as indicated both by the Examiner and as described above, both Weber et al. and the instant application were subject to an obligation of assignment to the same person at the time the invention of the instant application was made. Accordingly, the rejection of claims 22-25 under 35 U.S.C. § 103(a) as being unpatentable over Weber et al. in view of Sturman et al. should be withdrawn.

Applicants respectfully traverse the 35 U.S.C. § 103(a) rejection of claims 22-25 as being unpatentable over Hara et al. in view of Sturman et al. No *prima facie* case of obviousness has been established with respect to claims 22-25 for at least the reason that no combination of Hara et al. and Sturman et al. discloses or suggests every claim element. For example, independent claim 21, from which claims 24 and 25 ultimately depend, recites a combination of elements including, among other things, a cam assembly configured to open and close an intake port, an electromagnetic actuator configured to affect closing of the intake port, and a rocker arm disposed between the

cam assembly and the electromagnetic actuator, the rocker arm being configured to engage an intake valve. Hara et al. and Sturman et al., alone and in combination, fail to disclose or suggest at least these claim elements.

As described above, the Examiner has maintained that first and second swing cams (56, 57) of Hara et al. constitute the cam assembly, that first swing cam (56) constitutes the rocker arm, and that electromagnetic drive mechanism (24) constitutes the electromagnetic actuator of independent claim 21. However, swing cam (56) of Hara et al. is not disposed between electromagnetic drive mechanism (24) and swing cam (57). In contrast, as illustrated in Figs. 8 and 13, swing cams (56) is disposed between electromagnetic drive mechanism (24) and an intake valve. Sturman et al., which was cited only for its alleged teaching of a controller, fails to remedy these deficiencies.

Because Hara et al. and Sturman et al., taken alone and in combination, fail to disclose or suggest all of the elements of claims 24 and 25, no *prima facie* case of obviousness has been established with respect to claims 24 and 25. Accordingly, the section 103(a) rejection with respect to claims 24 and 25, as being unpatentable over Hara et al. in view of Sturman et al., is improper and should be withdrawn.

Applicants respectfully traverse the 35 U.S.C. § 103(a) rejection of claims 22-25 as being unpatentable over Takizawa et al. in view of Sturman et al. No *prima facie* case of obviousness has been established with respect to claims 22-25 for at least the reason that no combination of Takizawa et al. and Sturman et al. discloses or suggests every claim element. For example, independent claim 21, from which claims 24 and 25 ultimately depend, recites a combination of elements including, among other things, a

cam assembly configured to open and close an intake port, an electromagnetic actuator configured to affect closing of the intake port, and a rocker arm disposed between the cam assembly and the electromagnetic actuator, the rocker arm being configured to engage an intake valve. Takizawa et al. and Sturman et al., alone and in combination, fail to disclose or suggest at least these claim elements.

As described above, the Examiner suggested that a cam (41), an electromagnetic valve (43), and a rocker arm (13) of Takizawa et al. constitute the cam assembly, electromagnetic actuator, and rocker arm of independent claim 21. However, rocker arm (13) is not disposed between a cam assembly and an electromagnetic actuator. In contrast, as illustrated in the figure of Takizawa et al., rocker arm (13) of Takizawa et al. is not located between any other components of Takizawa et al. at all. Sturman et al., which was cited only for its alleged teaching of a controller, fails to remedy these deficiencies.

Because Takizawa et al. and Sturman et al., taken alone and in combination, fail to disclose or suggest all of the elements of claims 24 and 25, no *prima facie* case of obviousness has been established with respect to claims 24 and 25. Accordingly, the section 103(a) rejection with respect to claims 24 and 25, as being anticipated by Takizawa et al. in view of Sturman et al., is improper and should be withdrawn.

Applicants respectfully traverse the 35 U.S.C. § 103(a) rejection of claims 22-25 as being unpatentable over Aoyama et al. in view of Sturman et al. No *prima facie* case of obviousness has been established with respect to claims 22-25 for at least the reason that no combination of Aoyama et al. and Sturman et al. discloses or suggests every claim element. For example, independent claim 21, from which claims 24 and 25

ultimately depend, recites a combination of elements including, among other things, a cam assembly configured to open and close an intake port, an electromagnetic actuator configured to affect closing of the intake port, and a rocker arm disposed between the cam assembly and the electromagnetic actuator, the rocker arm being configured to engage an intake valve. Aoyama et al. and Sturman et al., alone and in combination, fail to disclose or suggest at least these claim elements.

As described above, the Examiner suggested that a control mechanism (20), a hydraulic actuator (21) and a hydraulic control module (22), and a rockable cam (24) of Aoyama et al. constitute the cam assembly, electromagnetic actuator, and rocker arm of independent claim 21. However, rockable cam (24) is not disposed between a cam assembly and an electromagnetic actuator. Sturman et al., which was cited only for its alleged teaching of a controller, fails to remedy these deficiencies.

Because Aoyama et al. and Sturman et al., taken alone and in combination, fail to disclose or suggest all of the elements of claims 24 and 25, no *prima facie* case of obviousness has been established with respect to claims 24 and 25. Accordingly, the section 103(a) rejection with respect to claims 24 and 25, as being unpatentable over Aoyama et al. in view of Sturman et al., is improper and should be withdrawn.

Applicants respectfully traverse the 35 U.S.C. § 103(a) rejection of claims 22-25 as being unpatentable over Uehara et al. in view of Sturman et al. No *prima facie* case of obviousness has been established with respect to claims 22-25 for at least the reason that no combination of Uehara et al. and Sturman et al. discloses or suggests every claim element. For example, independent claim 21, from which claims 24 and 25 ultimately depend, recites a combination of elements including, among other things, a

cam assembly configured to open and close an intake port, an electromagnetic actuator configured to affect closing of the intake port, and a rocker arm disposed between the cam assembly and the electromagnetic actuator, the rocker arm being configured to engage an intake valve. Uehara et al. and Sturman et al., alone and in combination, fail to disclose or suggest at least these claim elements.

As described above, the Examiner suggested that a drive cam (15), a rockable cam (17), and a rocker arm (23) of Uehara et al. constitute the cam assembly; that rockable cam (17) constitutes the rocker arm; and that a motor (34) constitutes the electromagnetic actuator of independent claims 21 and 26. However, rockable cam (17) cannot be both a cam assembly and rocker arm. Further, even if rockable cam (17) could correctly be considered both a cam assembly and rocker arm, rockable cam (17) is not disposed between a cam assembly and an electromagnetic actuator. Sturman et al., which was cited only for its alleged teaching of a controller, fails to remedy these deficiencies.

Because Uehara et al. and Sturman et al., taken alone and in combination, fail to disclose or suggest all of the elements of claims 24 and 25, no *prima facie* case of obviousness has been established with respect to claims 24 and 25. Accordingly, the section 103(a) rejection with respect to claims 24 and 25, as being unpatentable over Uehara et al. in view of Sturman et al., is improper and should be withdrawn.

Applicants submit that new claims 28-44 are neither anticipated nor rendered obvious by the prior art of record. In particular, new claim 28 depends ultimately from independent claim 21 and is allowable for at least the same reasons as independent claim 21, in addition to its own recitations of novelty. Claims 29-39 recite combinations

of elements including, among other things, a cam assembly mechanically linked to an intake valve to open and close at least one intake port, and an electromagnetic actuator selectively mechanically linked to the intake valve. Claims 40-44 recite a combination of steps including, among other things, moving an intake valve to open and close an intake port via a cam that is mechanically linked to the intake valve, and moving the intake valve to close the intake port via an electromagnetic actuator that is selectively mechanically linked to the intake valve. Support for these new claims may be found at least in Fig. 2 and in paragraphs 27, 32, 39, and 40.

The Office Action contains characterizations of the claims and the related art with which Applicants do not necessarily agree. Unless expressly noted otherwise, Applicants decline to subscribe to any statement or characterization of the Office Action.


In view of the foregoing amendments and remarks, Applicants respectfully request the reconsideration of this application and the timely allowance of the pending claims.

If there is any fee due in connection with the filing of this Preliminary Amendment, please charge the fee to our Deposit Account No. 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW,
GARRETT & DUNNER, L.L.P.

Dated: January 11, 2005

By: 
Ryan C. Stockett
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